HUMS BAA Questions&Answers

TCBAA-06-0007 Health and Usage Monitoring Systems (HUMS)

Start date: January 31, 2006

Q1. Is there a range of dollar values for this effort that we should be aware of when we submit the white paper?

A1. Proposed budget should not exceed $300,000 (per modified TCBAA-06-0007 on 02/08/06).

Q2. The objective of the BAA indicates the focus of research is "….to collect and substantiate ***structural usage data*** (our emphasis) for maintenance credits." Is research and development to support the validation of HUMS usage for maintenance credits of the dynamic components or other subsystems also possible?

A2. Yes.

Q3. The proposal is clearly intended to develop HUMS data from actual flight tests, but the level of funding is insufficient for a robust flight test program. Is it possible to conduct the project to validate technology and processes with a smaller scale vehicle in order to make flight testing affordable? For example, could we use an experimental VTOL UAV already available at our facility for proof-of-concept purposes before transferring the technologies to an operational vehicle?

A3. Possible.

Q4. Is the FAA more interested in validation of current HUMS or exploration of new concepts using technology of suitable maturity, such as a new class of distributed HUMS processors based on newer, but commercially available processors?

A4. Any HUMS and HUMS-related technology applicable to addressing the FAA Advisory Circular (AC) 29-2C, Section MG-15 (HUMS AC), can be used in the research. However, we aim at having the validated technologies at the appropriate technology readiness level (TRL) that can be used to support the FAA HUMS AC for certification according to the FAA HUMS R&D Roadmap.

Q5. Is it permissible to contact the FAA Rotorcraft Program Manager, with questions, prior to the delivery of submission of white paper and/or formal technical proposal for subject?

A5. Due to the policy and volume of inquiries, technical questions in reference to TCBAA-06-0007 (HUMS) and TCBAA-06-0001 (RCDT), if there are, can be emailed to dy.le@faa.gov. Contracting-related questions can be emailed to the appropriate contracting officer listed on the FAA rotorcraft website using the link attached below. Answers will be posted on the FAA rotorcraft website using the attached link. No answer may be given by phone or email.

http://aar400.tc.faa.gov/Programs/agingaircraft/rotorcraft/Current_Contract_Opportunities.htm

Q6. Is it permissible to contact the FAA Southwest region (FAA Rotorcraft Directorate), with questions prior to delivery of submission of white paper and/or formal technical proposal for subject?

A6. Questions related to TCBAA-06-0007 (HUMS) and TCBAA-06-0001 (RCDT), if there are, must be sent by email to the appropriate points of contact at the FAA William J. Hughes Technical Center. The Technical Center is posting these two BAAs, not the FAA Rotorcraft Directorate. Additionally, the FAA Rotorcraft Directorate is the Aircraft Certification Office. The Technical Center is the designated research facility where R&D programs are being initiated, funded, and managed.

Q7. Can you provide a description of the types of projects funded last year under the HUMS call for proposals?

A7. From six HUMS BAAs announced in FY05, four contracts were awarded to the following companies:

a. Embry-Riddle Aeronautical University - Structural Usage Monitoring and Flight Regime Recognition Algorithm and Methodology Enhancement and Validation
b. Acellent Technologies, Inc. – Smart Patch System (SPS) for Condition-Based Maintenance of Rotorcraft Structures
c. Smiths Aerospace LLC, Electronic Systems – Development, Validation, and Demonstration of HUMS Technologies to Detect Rotorcraft Mechanical Faults
d. Smiths Aerospace LLC, Electronic Systems – HUMS Ground-Based Station Automation Testing Research

The following FY05 HUMS contracts are still being negotiated:

a. Commercial-of-the-Shelf (COTS) HUMS Ground-Based Station Assessment and Guidance Development
b. HUMS AC Compliance Validation and Demonstration – Structural Usage Monitoring and Flight Regime Recognition

Q8. Does the FAA have a debriefing process in which authors of unselected proposers are provided feedback on the evaluation of their proposals?

A8. All who submitted **white papers** would be automatically notified of the selection for further consideration or rejection of their proposed research. For **formal technical proposals**, if requested, a written summary of the FAA evaluation of their proposals will be provided. A teleconference, if needed and requested, may be arranged to address additional questions or to provide further clarifications on the written summary of the FAA evaluation.

Q9. Are you also looking for "human" health monitoring?

A9. No.

Q10. Please provide us with the minimum TRL level that is acceptable for the proposed projects. As you know addressing various aspects of certification requires different technology elements with various readiness levels. Your guidance in this regard will assist us in focusing in an appropriate technology domain.

A10. We may not be able to provide a minimum TRL that is acceptable for the proposed projects until we have a chance to review your proposed HUMS research. It depends on many factors, e.g., proposed technology, duration of research, and/or research funding. FAA HUMS R&D goal is to support the substantiation of AC-29-2C, Section MG15 on Airworthiness Approval of HUMS (HUMS AC). We plan to achieve airworthiness approval for rotorcraft HUMS installation, credit validation, and instructions for Continued Airworthiness for a full range of HUMS application. According to our FAA HUMS R&D Roadmap, we envision that it may take from 5 to 10 years to achieve our goal.

The exit TRL that we are looking for in HUMS research, however, is required to be sufficient to certify HUMS for usage credits.

For your information, a link to a list of TRL definitions is listed below and also attached on our Current Contract Opportunities page.

http://www.tswg.gov/tswg/techtrans/TRLDefinitions.pdf

Q11. Can we have a meeting or teleconference as soon as possible with the FAA to ensure that we fully understand your requirements and can develop a clear strategy to satisfy your need?

A11. We have carefully reviewed all options and our schedules to see if a meeting or a teleconference is feasible to discuss the HUMS BAA. Unfortunately, it is determined that it cannot be done at this time.

Additionally, we believe that the rotorcraft BAA descriptions are sufficiently clear. If you still have any questions related to any specific rotorcraft BAA, please forward them to the appropriate points of contact listed on the FAA rotorcraft website. The FAA would respond to your questions and post them on the FAA rotorcraft website in a timely manner.

For your information, we have sent out our invitation to a meeting to be held on March 21, in the morning, to disseminate the rotorcraft damage tolerance R&D roadmap followed by a general meeting in the afternoon to respond to any additional questions that you may have for both TCBAA-06-0007 (HUMS) and TCBAA-06-0001 (RCDT). The meeting will be held at the FAA William J. Hughes Technical Center.

We would also want to remind you all that we are currently reviewing proposals as soon as they are received. We plan to make multiple awards as soon as we can until the funding is exhausted. Therefore, it is not advised to wait and submit the proposals after the meeting on March 21.

Q12. What is the budget for TCBAA-06-0007 HUMS?

A12. The FY06 budget for the subject BAA is approximately $2.6M.

Q13. Is there a 30-day submittal requirement counting from the date of BAA posting for the two-page technical summaries (white papers)?

A13. No. Two-page technical summaries will be accepted and reviewed for consideration until the FAA FY06 rotorcraft funding is exhausted (see A11). Formal technical proposals, if requested by the FAA, shall be submitted within 30 working days from the date of the FAA request via email.

Q14. Can the FAA provide some advices on what research program is worth proposing under these BAAs?

A14. No. We cannot give any additional advices on what program or approach would be worth proposing under these BAAs. The subject rotorcraft BAA has already provided sufficient guidance on the FAA rotorcraft research requirements.

Q15. Is it permissible to have a cover page in addition to the two-page Technical Summary that would identify the program title and include restricted notices?

A15. A cover page is allowed. However, the review and evaluation of the two-page technical summary (white papers) will not take into account of any technical information, if there are, on the cover page.

For your information, only the evaluation team members, who have been selected as members of the Technical Evaluation Committee, and the Primary Technical Officer are allowed to have access to two-page technical summary and formal technical proposals. All FAA personnel mentioned above must sign the FAA Nondisclosure of Information prior to reviewing the proposals.

Q16. Since it is FAA's goal to achieve a system that is qualified to meet AC-29-2C, MG-15, and that requires DO 178, Level B compliant software, is a program that utilizes data obtained with a system that is not Level B compliant acceptable to the FAA for the demonstration/development of downstream software applications?

A16. The goal of the FAA HUMS research is to validate the HUMS AC, and/or show valid reasons why changes should be made. To validate the AC to the maximum extent, it would be necessary to use the AC to develop a HUMS that would use most, if not all of the AC's guidance. Only high criticality systems would accomplish this goal. Therefore, to get the most return for our research funding, the research HUMS must be one that addresses the highest criticality defined in the AC.

Q17. Since there are many emerging and potentially viable technologies/methodologies that are at a relatively low TRL, is it acceptable to the FAA to advance the methodologies to a TRL of 6?

A17. In order to get the best return for our money, we would want to have a developed TRL as high as possible, but there could be consideration for new concepts if they do result in useable TRL, from a near future development standpoint. However, the initial plan for HUMS research in the short term should minimize this aspect. The long-term plan for research should include this type of technology that would be accepted on a case-to-case basis.